1. A procedure for improving the performance of electrodes, catalyst-coated membranes (CCMs), or membrane-electrode assemblies (MEAs) in an electrochemical cell, said procedure comprising the steps of:

a) hydrating said electrodes, CCMs and MEAs at an elevated temperature above ambient, in order to enhance performance; and

b) operating said electrochemical cell comprising the electrodes, CCMs, or MEAs, and observing said performance.

2. The procedure according to claim 1, wherein said hydrating does not exceed 30 minutes.

3. The procedure according to claim 1, wherein the hydrating is accomplished using an aqueous solution.

4. The procedure according to claim 3, wherein the aqueous solution contains at least one inorganic material.

5. The procedure according to claim 3, wherein the aqueous solution contains at least one organic material.

6. The procedure according to claim 3, wherein the aqueous solution contains at least one polymeric material.

7. The procedure according to claim 3, wherein the temperature of the aqueous solution is controlled between above room temperature and boiling.

8. The procedure according to claim 3, wherein the aqueous solution is in the form of steam.

9. The procedure according to claim 1, wherein the said electrodes, CCMs, and MEAs are kept in the liquid phase during operation in accordance with said operating step (a).

10. The procedure according to claim 1, wherein the said electrodes, CCMs, and MEAs are kept in the vapor phase during operation in accordance with said operating step (a).

11. An article fabricated in accordance with the procedure of claim 1, wherein said electrodes, CCMs, and MEAs, contain at least one catalyst layer comprising ionic material, and a water-repelling agent.

12. An article fabricated in accordance with the procedure of claim 1, wherein the electrochemical cell comprises a proton-exchange membrane fuel cell.

13. An article fabricated in accordance with the procedure of claim 1, wherein the electrochemical cell comprises a direct methanol fuel cell.

14. An article fabricated in accordance with the procedure of claim 1, wherein the electrochemical cell comprises an electrolyzer.

15. An article fabricated in accordance with the procedure of claim 1, wherein said CCMs are composed of an ion-conducting membrane and at least one catalyst layer bonded thereto.

16. An article fabricated in accordance with the procedure of claim 1, wherein the said CCMs are composed of an ion-conducting membrane and two, spaced-apart catalyst layers, each being bonded on opposite sides of the membrane.

17. The article in accordance with claim 16, wherein the said ion-conducting membrane comprises a material selected from a group of materials consisting of: a non-fluorinated ionomer, partially fluorinated ionomer, perfluorinated ionomer, sulphonated polyetherketone, sulphonated polysulfone, sulphonated polyphosphazene, polystyrene sulphonic acid, and acid-doped polybenzimidazole.

18. The article according to claim 16, wherein said ion-conducting membrane contains organic or inorganic dopants.

19. The article according to claim 16, wherein said ion-conducting membrane contains organic or inorganic fillers.

20. The article according to claim 16, wherein said ion-conducting membrane is composed of a supporting template whose pores are filled with at least one ion-conducting material.